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ABSTRACT

This study used television segments to investigate the impact of multimedia in establishing context for text learning. Adult participants (n=128) were shown a video either before or after reading a story. The video shown before reading was intended to create a "set" for either a burglar or buyer perspective contained in the story. The video shown after reading was included to separate context effect due to acquisition from recall. The number of target items recalled with and without the "set" was compared for each perspective. The results indicated an interaction between set and recall level, so that the context effect was found in the video-to-text condition for the low-recall subgroup. The high-recall subgroup were also affected by video set but were also found to recall greater number of both with Set and with No-Set target items. These results were interpreted within the framework of context or set effect, where the video subtly cued the reader to selectively read and comprehend written material. The study proposes a theoretical rationale for, and demonstrates an efficient means of, using multimedia to focus learners' attention to specific elements contained in a general text. (Contains 34 references and 4 tables.) (Author/BEW)

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Selective Set Effects Produced by Television Adjunct in Learning from Text

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Abstract

The impact of multimedia in establishing context for text learning was investigated using television segments. 128 adult participants were shown a video either before or after reading a story. The video shown before reading (Video->Text) condition was intended to create a set for either a burglar or buyer perspective contained in the story. The video shown after reading (Text ->Video) condition was included to separate context effect due to acquisition from recall. The number of target items recalled with and without set was compared for each perspective. The results indicated an interaction between set and recall level, so that the context effect was found in the Video->Text condition for the low-recall subgroup. The participants in the high-recall subgroup were also affected by video set but were also found to recall greater number of both With Set and With No Set target items. These results were interpreted within the framework of context or set effect, where the video provided subtle cues the reader used to selectively read and comprehend written material. The study proposes a theoretical rationale for and demonstrates an efficient means of using multimedia to focus learner's attention to specific elements contained in a general text.

Selective Set Effects Produced by Television Adjunct in Learning from Text

Information technology has made it feasible to enrich both individual and group instruction with a broad variety of visual and aural materials. Video, computers, CDs, and broadband communication lines permit the intertwining of text with films, graphics, and sound recordings. Multimedia refers to such combination of text with other stimuli, and technological advances have made the inclusion of resulting vivid materials to individual workstations and classrooms possible. A good deal of optimism has been expressed about educational benefits that would result from multimedia instructional streams (e.g., Baggett, 1987; Ediger, 1988; Kozma & Johnston, 1991; Meroney, 1994). However, empirical results or theoretical analyses that detail the expected impact of these techniques are scarce, calling for systematic exploration and demonstration of their use. The present study, therefore, aims to document one instructional purpose for using filmic material as an adjunct to text material; namely, to guide selective attention during reading.

Studies by Pichert and Anderson (1977; R. C. Anderson & Pichert, 1978) after which this study was modelled, demonstrated how information can become important because of their relevance to a reader's perspective or point of view. They had participants read a story written to contain approximately equal numbers of features of interest to one of two perspectives, resulting in a greater proportion of story recalled in the assigned perspective. They concluded that there is a relationship between perspective with which story is read, learned and recalled, and that the perspective taken while reading is important for learning by providing a pathway for memory. Besides direct verbal instruction, however, there are other factors that can have profound indirect effect on students' learning experience. As J. R. Anderson (1990) stated, "memory for to-be-learned material can be heavily dependent on the context of other to-be-learned material in which it is embedded. This context provided other study materials, however, can be indirectly

established" (p. 205). Such indirect factors include recent conversations and previously read materials. This experiment was designed to demonstrate one of these indirect factors; the effects of television viewing on the learning and recall of written material. The availability of televisions in most classrooms makes it possible to study set or context effect without learner's awareness, thereby providing teachers with a new tool for instruction.

The general approach of this study was to show a segment of a television program prior to reading to see what was remembered from the text. Researchers (e.g., Howard & Rothbart, 1980; Rothkopf & Kaplan, 1972; Topp, Kulhavy, & Webb, 1986; Wyer, Srull, Gordon, & Hartwick, 1982; Zadny & Gerard,1974) found that when the text contained two distinct and contrasting types of information, the context established at the time of encoding affects what statements the participants judge to be true, and that the manipulation of the retrieval context has little or no effect on participants' recognition of statements from the text. Because context effect may be a function of both encoding (or acquisition) and recall, a second condition was also added whereby the video was shown after reading the story. It was hypothesized that providing a set before reading the story would affect the perspective taken while reading and number of target items recalled from the story.

Method

The effect of establishing a set by means of television was investigated by having participants watch a video either before or after reading a story. The participants then recalled the story after an intervening task. Finally, the recall was analyzed to see if the set influenced what they learned and recalled.

Procedure

Each participant was randomly assigned, and the stimulus order (Video->Text or

Text-> Video) was varied between subjects. As a cover story, they were told to watch the video so that emotional reaction to watching television can be analyzed. The procedure consisted of the following four steps:

Set. Participants watched the first video (either the Home Protection or the Home Buyer video) in separate stations containing a VCR, television and headphones.

Text. Participants were given as much time as needed to read the story, but everyone finished reading within three minutes.

Intervening Task. The story was collected and participants were shown the Public Speaking video to minimize rehearsal.

Free Recall. Participants were were told to write down the story they had read earlier, as close to the actual wording as possible. This task was also subject paced.

The order of the steps for the two conditions are displayed in Tables 1 and 2 (see Tables 1 and 2).

Materials

A 372-word story (see Pichert & Anderson, 1977), suitable for a fifth grade reading level was used in this study (Flesch reading ease = 81.4). The story was written to contain approximately equal numbers of features of interest to a burglar and to a prospective home buyer. In addition, the following three videos were used in this study:

Home Protection Video. A video segment twelve minutes long containing an excerpt from an instructional video on protecting home from intruders and thieves. (Flesch reading ease = 71.7)

Home Buyer Video. A video segment ten minutes long containing an excerpt from an instructional video on finding and purchasing a home. (Flesch reading ease = 72.1)

Public Speaking Video. A video segment eleven minutes long containing an excerpt from an instructional video on giving a speech in front of a group. (Flesch reading ease = 70.9)

Participants

Participants were native English speakers (N=128) who were studying at the Columbia University. They were recruited through an ad and were paid for their participation in the experiment.

Results

Each participant's written recall was scored for the number of With Set and With No Set target words (see Tables 1 and 2). The assumption underlying this measure of learning was that we would know a set is established if people recalled more target items from a perspective when a related video was shown than when not shown. For this purpose, five judges divided the story into 68 total idea units, and out of these idea units, target items important to a prospective burglar (Burglar) or to a prospective home buyer (Buyer) were identified. There were total of 17 such target items for each of the Burglar and Buyer perspectives. The rest of the targets were decided to be neither Burglar- nor Buyer-relevant and were designated as Non-Target idea units.

The recall data for the Video->Text condition are presented in Table 3 (see Table 3). The total scores for each perspective suggest that there is no significant main effect between the recalls of With Set and With No Set targets. However, there were two types of readers within each condition, labeled low-recall and high-recall, who differed on the level of recall and on the degree of set effect. This interaction was especially true for the low-recall participants. As expected, the set effect was significant for the low-recall subgroup ($p < .05$). Those people who recall less of what was read benefited especially by a video segment that provided context and helped them focus on the text while reading. Although may not be immediately apparent, the high-recall

participants benefited as well, if not more, from the video set. It is important to note that these high-recall readers were not prohibited from recalling additional information in addition to increasing recall of With Set targets. Because these readers are good at both paying attention to the important elements and remembering other details, they have greater recall of the With No Set targets over the low-recall participants. Thus, what appears to be no significant effect for the high-recall subgroup may in fact be a combination of set effect and greater recall ability.

Also as expected, the data from the Text->Video condition, presented in Table 4, indicate that the video does not create a set when shown after reading (see Table 4). This confirms that providing context or providing a schematic structure before reading is stronger than afterwards because both encoding and retrieval processes are involved. Because showing a video after reading does not establish a set, no data in the Text->Video condition reached significance.

While the recalls of the With Set targets for the low-recall subgroup in the Video->Text condition are fewer than for the high-recall subgroup, the recalls of the With No Set targets are even lower. This may be explained by the fact that providing a schema or context during encoding suppresses the irrelevant information, more than increase the relevant information. The greater number of recalls, in general, for the Text->Video condition over the Video->Text condition (although all are not significant) also indicates a greater suppression of irrelevant targets than increase of relevant targets. Many researchers assert that reading selectively may be as much a function of paying attention to appropriate and relevant text elements, as disregarding the irrelevant ones. For instance, Fiske & Taylor (1991) noted, "whether people remember consistent or inconsistent information, it is important to note that they neglect information irrelevant to the schema" (p. 132). In addition, Schwanenflugel & Shoben (1985) found that context that

facilitates expectations for a word interferes and suppresses the recognition of the unexpected word.

Discussion

This study demonstrates that information may become important indirectly, without learner's knowledge, through use of video segment. This study also proposes a theoretical rationale for enriching presentation of educational material and explains how factors such as recently viewed television programs increase attention given later to more important things. Watching a video before reading the story can establish context which facilitated and guided student's learning and help the reader focus on relevant details. This effect was found to be especially helpful to the readers who recalled fewer information. The results also suggest that set effect occurs by suppressing the recall of irrelevant targets as well as by increasing the recall of relevant targets. Researchers (e.g., Downs & Linnehan, 1993; Merrill, Cha, & Moore, 1994; Quist, 1995) have found similar phenomenon with content areas such as writing instruction and with learners such as the learning disabled readers.

Research has long noted that important text elements result in better learning and recall than those elements that are less important (Johnson, 1970; Newman, 1939). Teachers often select reading materials to provide students with meaningful contexts for a particular learning activity, using "text that has been tightly edited from an instructional point of view, in the sense that most instructionally irrelevant information has been removed" (Rothkopf & Kaplan, 1972, p. 295). The problem with general or off-the-shelf material is that they convey many different information, making it difficult for the learner to attend to those elements the instructor is emphasizing. With a video shown beforehand, a teacher can still focus learner's attention to specific instructional goals with a general textbook, thereby eliminating the expense and

inefficiency of editing or finding a more specific material. Indirect set effects may also be more appealing to instructors in the involvment of incidental rather than intentional learning task. There is evidence that such indirect set effect or incidental learning may be better than direct instruction (e.g., Hedgcock and Lefkowitz, 1993). Rothkopf (1995) wrote:

> Instructional media, whether through words, motion pictures, graphics, or animated cartoons present the world from a particular point of view ... Selection, instruction from a particular point of view, is more pronounced with pictorial media than when instruction is carried forward primarily through language. Language has inherent ambiguity that cannot be expunged even with meticulous editing, partly because of great difference in general experience among readers or listeners. (p.10)

Visual material has multiple uses in instruction, but the one demonstrated in this study is by focusing learner's attention to relevant elements. Other possible factors for increased learning such as enthusiasm, interest, or attention, were not directly measured in this experiment. With the increase in educational technology, understanding how multimedia affects learning is important in creating a meaningful learning environment. The key to an effective instructional design may well lie in the educators' flexibility and creativity in maximizing these influences. Future studies with other forms of multimedia and learning activities should advance the present knowledge regarding multimedia's role in guiding attention.

Table 1:

Procedure for (Video->Text) Condition

Watch Video -> Read Story -> Irrelevant Task -> Free Recall

Burglar	Burglar (with set) Buyer (with no set)
- or -	
Buyer	Burglar (with no set) Buyer (with set)

Burglar (with set) target recall compared to Burglar (with no set) target recall.

Buyer (with set) target recall compared to Buyer (with no set) target recall.

Table 2:

Procedure for (Text->Video) Condition

Read Story -> Watch Video -> Irrelevant Task -> Free Recall

Burglar	Burglar (with set) Buyer (with no set)
- or -	
Buyer	Burglar (with no set) Buyer (with set)

Burglar (with set) target recall compared to Burglar (with no set) target recall.

Buyer (with set) target recall compared to Buyer (with no set) target recall.

Table 3

Recalls for (Video->Text) condition

Perspective and subgroups	Targets recalled with Set M*	(SD)	Targets recalled with No Set M	(SD)	Set -- No Set targets two-tailed at $p < .05$
Total Burglar	7.2	(3.9)	6.4	(4.3)	0.784, ns
low-recall**	5.5	(1.9)	3.6	(2.3)	2.582, sig
high-recall	9.3	(4.8)	8.6	(4.2)	0.440, ns
Total Buyer	6.8	(2.9)	5.8	(3.4)	1.261, ns
low-recall	6.1	(2.2)	4.1	(2.0)	2.677, sig
high-recall	7.4	(3.3)	8.0	(3.6)	0.490, ns

* All numbers rounded to the nearest decimal point.

** low-recall = participants whose recall of Non-Target Idea Units is fewer than the median for the entire condition.

high-recall = participants whose recall of Non-Target Idea Units is greater than the median for the entire condition.

Table 4

Recalls for (Text->Video) condition

Perspective and subgroups	Targets recalled with Set M*	(SD)	Targets recalled with No Set M	(SD)	Set -- No Set targets two-tailed at $p < .05$
Total Burglar	8.8	(3.8)	8.0	(3.5)	0.881, ns
low-recall**	6.8	(2.8)	6.0	(3.3)	0.740, ns
high-recall	11.4	(3.4)	9.6	(2.8)	1.661, ns
Total Buyer	7.2	(2.9)	7.3	(3.7)	0.121, ns
low-recall	5.7	(2.6)	5.6	(3.3)	0.094, ns
high-recall	8.3	(2.7)	9.6	(2.8)	1.326, ns

* All numbers rounded to the nearest decimal point.

** low-recall = participants whose recall of Non-Target Idea Units is fewer than the median for the entire condition.

high-recall = participants whose recall of Non-Target Idea Units is greater than the median for the entire condition.

References

Anderson, J. R. (1990). Cognitive psychology and its implications. (3rd ed.). New York: W. H. Freeman.

Anderson, R. C. (1982). Allocation of attention during reading. In A. Flammer & W. Kintsch (Eds.), Discourse Processing (pp. 292-305). New York: North-Holland.

Anderson, R. C. & Faust, G. W. (1967). The effects of strong formal prompts in programmed instruction. American Educational Research Journal, 4, 345-352.

Anderson, R. C., & Pichert, J. W. (1978). Recall of previously unrecallable information following a shift in perspective. Journal of Verbal Learning and Verbal Behavior, 17, 1-12.

Ausubel, D. P. (1960). The use of advance organizers in the learning and retention of meaningful verbal processing. Journal of Educational Psychology, 51, 267-272.

Baggett, P. (1987). Learning a procedure from multimedia instructions: The effects of film and practice. Applied Cognitive Psychology, 1(3), 183-195.

Downs, J. R., & Linnehan, P. J. (1993, March). Computers as writing tutors. Paper presented at the Annual Meeting of the Conference on College Composition and Communication, San Diego, CA.

Ediger, M. (1988). Reading and the language arts. (Report No. CS009377). Washington, DC: Department of Education. (ERIC Document Reproduction Service No. ED 300769)

Fiske, S. T., & Taylor, S. E. (1991). 2nd Edition. Social Cognition. New York: McGraw-Hill.

Frase, L. T. (1975). Prose processing. In G. H. Bower (Ed.), The psychology of learning and motivation. New York: Academic Press.

Hedgcock, J., & Lefkowitz, N. (1993). Tuning in on the "Prime Time": Channel effects and priming in L2 grammaticality judgments. Foreign Language Annals, 26 (3), 297-307.

Howard, J. W., & Rothbart, M. (1980). Social categorization and memory for ingroup and outgroup behavior. Journal of Personality and Social Psychology, 38, 301-310.

Johnson, R. E. (1970). Recall of prose as a function of the structural importance of the linguistic units. Journal of Verbal Learning and Verbal Behavior, 9, 12-20.

Kintsch, W., & van Dijk, T. A. (1978). Toward a model of text comprehension and production. Psychological Review, 85, 363-394.

Kozma, R., & Johnston, J. (1991). The technological revolution comes to the classroom. In J. Hirschbuhl & L. Wilkinson (Eds.), Computers in education (5th ed.) (pp. 19-28). Guilford, CT: Dushkin.

Meroney, B. (1994). Improving the literacy growth of second grade students through the use of whole language, peer tutoring, cooperative learning, and computer-based instruction. Unpublished Ed.D. Practicum, Nova Southeastern University, Florida.

Merrill, E. C., Cha, K.-H., & Moore, A. L. (1994). Suppression of Irrelevant Location Information by Individuals with and without Mental Retardation. American Journal on Mental Retardation, 99 (2), 207-14.

Newman, E. B. (1939). Forgetting of meaningful material during sleep and working. American Journal of Psychology, 70, 680-690.

Pichert, J. W., & Anderson, R. C. (1977). Taking different perspectives on a story. Journal of Educational Psychology, 69, 309-315.

Quist, S. (1995, April). The effect of using graphic organizers with learning disabled students to increase comprehension. Unpublished master's project, Kean College, New Jersey.

Reynolds, R. E., Standiford, S. N., & Anderson, R. C. (1979). Distribution of reading time when questions are asked about a restricted category of text information. Journal of Educational Psychology, 7, 183-190.

Rothkopf, E. Z. (1966). Learning from written instructive materials: An exploration of the control of inspection behavior by test-like events. American Educational Research Journal, 3, 241-249.

Rothkopf, E. Z. (1976). Writing to teach and reading to learn: A perspective on the psychology of written instruction. In N. L. Gage (Ed.), The psychology of teaching methods. Seventy-fifth yearbook of the National Society for the Study of Education (pp. 91-129). Chicago, IL: University of Chicago Press.

Rothkopf, E. Z. (1995). General properties of technological systems for instruction. Unpublished manuscript.

Rothkopf, E. Z., & Billington, M. J. (1979). Goal guided learning from text: Inferring a descriptive processing model from inspection times and eye movements. Journal of Educational Psychology, 71, 310-327.

Rothkopf, E. Z., & Kaplan, R. (1972). Exploration of the effects of density and specificity of instructional objectives on learning from texts. Journal of Educational Psychology, 63, 295-302.

Schwanenflugel, P. J. & Shoben, E. J. (1985). The influence of sentence constraint on the scope of facilitation for upcoming words. Journal of Memory and Language, 24, 232-252.

Shirey, L. L. (1992). Importance, interest, and selective attention. In S. Hidi, K. A. Renninger, & A. Krapp (Eds.) The role of interest in learning and development. Hillsdale, NJ: Erlbaum (pp. 281-296).

Topp, B. W., Kulhavy, R. W., & Webb, K. S. (1986, April). Schema instantiation and the acquisition and reconstruction of new knowledge from text. Paper presented at the Annual Meeting of the American Educational Research Association San Francisco, CA.

van Dijk, T. A., & Kintsch, W. (1983). Strategies of discourse processing. New York: Academic Press.

Wegner, D. M., & Schneider, D. J. (1989). Mental control: The war of the ghosts in the machine. In J. S. Uleman & J. A. Bargh (Eds.) Unintended thought. (pp. 287-303). New York, NY: The Guilford Press.

Wyatt, M & Hayes, D. A. (1991, December). Analogies as sources of interference to learning from texts with study guides. Paper presented at the annual meeting of the national reading conference, Palm Springs, CA.

Wyer, R. S., Jr., Srull, T. K., Gordon, S. E., & Hartwick, J. (1982). Effects of processing objectives on the recall of prose material. Journal of Personality and Social Psychology, 43, 674-688.

Zadny, J., & Gerard, H. B. (1974). Attributed intentions and informational selectivity. Journal of Experimental Social Psychology, 10, 34-52.